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throw Light on the Problem of its Constitution'; Section IV., 'Cellulose Groups, including Hemicelluloses and Tissue Constituents of Fungi'; Section V., 'Furfuroids, *i. e.*, Pentosanes and Furfural-yielding Constituents Generally'; Section VI., 'The Lignocelluloses'; Section VII., 'Pectic Group'; Section VIII., 'Industrial and Technical; General Review'; Index of authors; Index of subjects.

The authors should be highly commended for their appreciation and treatment of the practical industrial problems connected with cellulose. Pure science is not lowered in the estimation of most men because it may have practical bearings, and it is almost needless to say that some of the greatest advancements in scientific knowledge have been brought about by men who had an eye for the practical as well as the scientific side of investigations. The subject is developing rapidly at the present time from both the scientific and the practical side, and it certainly offers an inviting field for students of chemistry who wish to make their work count for something in the commercial as well as the scientific world.

A. F. WOODS.

#### SCIENTIFIC JOURNALS AND ARTICLES.

THE *Journal of Comparative Neurology* for June contains the following articles: (1) 'Number and Size of the Spinal Ganglion Cells and Dorsal Root Fibers in the White Rat at Different Ages,' by S. Hatai. The number of spinal ganglion cells does not change with age, though some small cells become large cells and the number of dorsal root fibers increases. (2) 'Observations on the Medulla Spinalis of the Elephant with some Comparative Studies of the Intumescencia Cervicalis and the Neurones of the Columna Anterior,' by I. Hardesty. In addition to the histological examination of the elephant, there is a similar study of the spinal cords of a series of twelve mammals of diminishing body weights, with statistics of the ratios to body weights of the dimensions of the spinal cord and ventral horn cells. (3) 'Observations on the Post-mortem Absorption of Water by the Spinal Cord of the Frog,' by H. H. Donaldson and Daniel M. Schoe-

maker. There is a post-mortem absorption of water by the spinal cord of *Rana virescens* amounting sometimes in 24 hours to 25 per cent. of the normal weight of the cord. The conditions under which this absorption takes place were experimentally studied. (4) 'Observations on the Developing Neurones of the Cerebral Cortex of Fœtal Cats,' by S. Hatai. Confirms Paton's observation that the dendrites develop before the neurites or axones. The usual literary notices complete the number.

THE contents of the *American Journal of Mathematics* for July, 1902, are as follows:

'Die Typen der linearen Complexe elliptischer Curven im  $R_n$ ,' von S. Kantor; 'Generalization of the Differentiation Process,' by Robert E. Moritz; 'Simple Pairs of Parallel  $W$ -Surfaces,' by Henry Dallas Thompson.

#### SOCIETIES AND ACADEMIES.

##### THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

WE have received preliminary lists of the papers to be presented before three sections of the Pittsburg meeting of the American Association for the Advancement of Science, as follows:

##### SECTION C AND THE AMERICAN CHEMICAL SOCIETY.

*Tuesday, July 1, 1902.*

'Valence': IRA REMSEN.

'The Ozone from Potassium Chlorate': EDWARD HART.

'Electric Combustion': EDWARD HART.

'The Chlorides of Ruthenium': JAS. LEWIS HOWE.

'Electrolytic Deoxidation of Potassium Chlorate': WILDER D. BANCROFT.

'The Solid Phases in Certain Alloys': WILDER D. BANCROFT.

'An Improved Grinder for Analysis of Motherbeets': DAVID L. DAVOLL, Jr.

'The Electrical Conductivity and Freezing Points of Aqueous Solutions of Certain Metallic Salts of Tartaric, Malic and Succinic Acids': O. F. TOWER.

'Recent Progress in the Fireproofing Treatment of Wood': SAM'L. P. SADTLER.

'Ionic Velocities in Liquid Ammonia Solutions': E. C. FRANKLIN.

'The Expansion of a Gas into a Vacuum and the Kinetic Theory of Gases': PETER FIREMAN.

'Quantitative Blowpipe Analysis by Bead Colorations': JOSEPH W. RICHARDS.

'Solubility, Electrolytic Conductivity, and Chemical Action in Liquid Hydrocyanic Acid': LOUIS KAHLENBERG and HERMAN SCHLUNDT.

'Determination of Glucose': EDWARD GUDEMAN.

'Gluten Feed Analyses': EDWARD GUDEMAN.

'Arsenic Pentachloride': CHARLES BASKERVILLE and H. H. BENNETT.

'Black Rain in North Carolina': CHARLES BASKERVILLE and H. R. WELLER.

'A New Method for the Preparation of Pure Praseodymium Compounds': CHARLES BASKERVILLE and J. W. TURRENTINE.

'Deposition of Pure Thorium and Allied Elements with Organic Bases': CHARLES BASKERVILLE and F. H. LEMLY.

'A New Constant High Temperature Bath': CHARLES BASKERVILLE.

'A Process for Rendering Phosphoric Acid Available': CHARLES BASKERVILLE.

'Molecular Attraction': J. E. MILLS. (By title.)

'Condensation of Chloral with the Nitranilines': A. S. WHEELER and H. R. WELLER.

'The Composition of Urine and its Relation to Electrical Conductivity': JOHN H. LONG. (By title.)

'Symmetrical Trimethylbenzyl, Symmetrical Trimethylbenzyl Hydrazone and some of its Derivatives': EVERHART P. HARDING.

'1. 4. Dimethylbenzyl, 1. 4. Dimethylbenzyl Hydrazone and some Derivatives': EVERHART P. HARDING.

'The Action of Valerianic Acid and Valeric Aldehyde upon Antipyrin': DAVID C. ECCLES.

'On Conductivity': GEORGE A. HULETT.

'Relation between Negative Pressure and Osmotic Pressure': GEORGE A. HULETT. (By title.)

'Comparison of Results Obtained by Different Methods of Determining the Amount of Oxygen Absorbed by Waters Containing Oxidizable Substances': LEONARD P. KINNICUTT.

'The Old and the New in Steel Manufacture': WM. METCALF.

'Some Notes on Glass and Glass Making': ROBERT LINTON.

'Manufacture of Optical Glass': GEORGE A. MACBETH.

'Bessemer and Open-Hearth Steel Practice': EDWARD H. MARTIN and WM. BOSTWICK.

'Malleable Iron': H. E. DILLER.

'Manufacture of Plate Glass': FRANCIS P. MASON.

'Manufacture of White Lead': GERARD O. SMITH.

'Camphoric Acid: Synthesis of Trimethylparaconic Acid': W. A. NOYES and A. M. PATTERSON.

'The Hydrolysis of Maltose and Dextrine for the Determination of Starch': W. A. NOYES, GILBERT CRAWFORD, C. H. JUMPER, E. L. FLORY.

'Crucible Steel Manufacture': E. L. FRENCH.

#### SECTION D, MECHANICAL SCIENCE AND ENGINEERING.

'The Trend of Progress in Prime Movers': Director R. H. THURSTON, Cornell University.

'On Changes in Form as an Essential Consideration in the Theory of Elasticity': Mr. FRANK H. CILLEY, Brooklyn.

'On the Advantage of Siamesed Hose Lines for Fire Steamers': Professor MANSFIELD MERRIMAN, Lehigh University.

'The Nomenclature of Mechanics': Professor R. S. WOODWARD, Columbia University.

'U. S. Work in the Ohio, Allegheny and Monongahela Rivers near Pittsburg': Mr. THOMAS P. ROBERTS, Pittsburg.

'On a Type of Planetary Orrery Using the Mechanical Principle of the Conical Pendulum': Professor DAVID P. TODD, Amherst College.

'On the Ratio of the Transverse to the Longitudinal Elastic Strain Produced by Longitudinal Stress': Professor THOMAS GRAY, Rose Polytechnic Institute, Terre Haute, Ind.

'On the Effect of Hardening Steel on its Young's Modulus': Professor GRAY.

'A Test of a Ball Thrust Bearing': Professor GRAY.

'A New Photometer, with Exhibition of the Instrument': Professor C. P. MATTHEWS, Purdue University.

'The Mechanics of Reinforced Concrete Beams': Professor W. K. HATT, Purdue University.

'Some Experiences with a Simple Babbitt Testing Machine': Mr. E. S. FARWELL, New York City.

'The Rules and Regulations Concerning Airship Contests at the Louisiana Purchase Fair': Professor C. M. WOODWARD, Washington University, St. Louis.

'Long Distance Electric Transmission Regarded as a Hydrodynamic Phenomenon': Professor H. T. EDDY, University of Minnesota.

'The Effect of Weeds and Moss upon the Co-

efficients of Discharge in Small Irrigating Canals': Professor J. C. NAGLE, College Station, Texas.

It is expected that an evening illustrated stereopticon lecture will be given before this section by Captain Sibert upon the bridges and other interesting structures of the Philippines.

The first excursion of the Section will probably be on Tuesday afternoon, July 1, to the famous Carnegie Homestead plant. Other excursions to similar points are arranged and will be available to the members of the Section to any extent desired.

#### SECTION H, ANTHROPOLOGY.

*Monday, June 30, 1902.*

'Address of Retiring Vice-President': J. WALTER FEWKES.

'The Human Effigy Pipe, taken from Adena Mound, Ross Co., Ohio': WM. C. MILLS.

'Burials of Adena Mound': WM. C. MILLS.

'Gravel Kame Burials in Ohio': W. K. MOOREHEAD.

'Microscopical Sections of Flint from Flint Ridge, Licking Co., Ohio': WM. C. MILLS.

'Explorations of 1901 in Arizona': WALTER HOUGH.

'The Throwing Stick': GEORGE H. PEPPER.

'A Collection of Crania from Gazelle Peninsula, New Britain': GEORGE G. MACCUDY.

'Climatic Changes in Central Asia traced to their Probable Causes and Discussed with Reference to their Bearing upon the Early Migrations of Mankind': G. FREDERICK WRIGHT.

'Dr. Thomas Wilson's Career at Washington': W. K. MOOREHEAD.

'Anthropological Museums in Central Asia': G. FREDERICK WRIGHT.

'Anthropological Museums and Museum Economy': STEWART CULIN.

'Classification and Arrangement of the Collections of an Anthropological Museum': W. H. HOLMES.

'Methods of Collecting Anthropological Material': HARLAN I. SMITH.

'Preservation of Museum Specimens': WALTER HOUGH.

July 2 and 3, meeting with the American Folk-Lore Society.

#### BIOLOGICAL SOCIETY OF WASHINGTON.

THE 357th meeting, the last of the season, was held on Saturday evening, May 31.

D. E. Salmon and C. W. Stiles presented a communication, made by Dr. Stiles, on 'Surra, a Disease in the Philippines of Great Military Importance.' The speaker stated that the disease known as surra has been diagnosed among the horses in the Philippines, and has led to the prohibition of landing any animals from those islands at any ports of the United States or of the dependencies thereof.

This disease is caused by a microscopic parasite (*Trypanosoma Evansi*) which lives in the blood, and the evidence now accessible indicates that this organism is transmitted by means of biting flies, especially by members of the genus *Tabanus* (horse-flies); other methods of dissemination are not excluded. It is chiefly a wet-weather disease, and is reported as invariably fatal to horses and mules. It occurs in other animals—such as camels, elephants, dogs, cats, etc.—more rarely in ruminants, and may be transmitted to goats, sheep and other mammals, but is not yet reported for birds. It is more or less common in India. Its introduction into the Philippines is unexplained, but it has probably existed there for some years past.

Parasites closely allied to this species occur in Europe, Africa and South America, in some cases causing disease known as tsetse-fly disease, dourine, mal de caderas, and rat trypanosomiasis. Certain authors believe that some of these maladies are identical with surra.

The chief symptoms of surra are fever, of an intermittent, and sometimes relapsing type; urticarial eruption; petechiæ on the mucous membranes; progressive anemia and emaciation; ravenous appetite and extreme thirst; more or less paralysis.

Treatment has not been satisfactory, but arsenic has been followed by good results in some cases. Prevention is difficult, but should consist in protecting horses from flies. Immediate isolation of the sick animals and protecting them from flies will result in restricting the disease. In some cases it will perhaps

be better to kill and immediately destroy the diseased animals.

From both the military and economic points of view surra must be looked upon as a very serious matter, and its introduction into the United States would result in very heavy losses.

Barton W. Evermann spoke on 'The American Species of Shad,' stating that from time to time reports had been received by the U. S. Fish Commission of the capture of shad in the Mississippi basin, but that these reports had proved either to have no foundation or to be based on some other fish. In 1897, however, Mr. James Sowders, of Louisville, forwarded four specimens of a true shad, saying that he had taken a few each year for many years past, but that only recently had he captured them in any number. The specimens proved to be a new species, which has been named *Alosa ohioensis*; it is more slender than the Atlantic shad, and has fewer gill rakers while it is much more slender than the Alabama shad and has more gill rakers than that species.

F. A. LUCAS.

#### THE ACADEMY OF SCIENCE OF ST. LOUIS.

At the meeting of June 2—sixteen persons present—Professor A. S. Langsdorf described the factory tests that are made on electrical machinery, illustrating the subject by lantern diagrams showing the circuits employed for the various tests, and by pictures of the machines as set up for testing in the factory.

A biographical sketch of the late Dr. A. Litton, one of the first members of the Academy, by Dr. G. C. Broadhead, was presented by Dr. Hambach.

Mr. H. A. Wheeler spoke of the occurrence, at Hematite, Mo., some forty miles below St. Louis, of a number of granite boulders, some of them showing the polishing action of ice; and accounted for their occurrence at this point, or some fifty miles beyond the southern limit of the terminal moraine, by the theory that they had been carried there on cakes of ice during the Loess period.

Mr. Wheeler and Professor Nipher discussed a recent newspaper account of the alleged

finding of a meteorite that was recently seen to fall in St. Louis, and agreed that the supposed meteorite, which both of them had examined, was merely a pyrite concretion from the coal measures, of the type called 'sulphur-balls' or 'nigger-heads,' which had probably been raked out from the grate-bars of the adjoining factory, and passed off on its discoverer as a meteorite.

Four persons were elected to active membership.

WILLIAM TRELEASE,  
*Recording Secretary.*

#### DISCUSSION AND CORRESPONDENCE.

##### THE EXPLOSIVE FORCE OF VOLCANOES.

TO THE EDITOR OF SCIENCE: Mr. A. E. Ver-  
rill's hypothesis as to the explosive forces of  
volcanoes, published in your columns, May 23,  
1902, was most interesting.

His theory as to the disassociation of the hydrogen and oxygen of the water penetrating by submarine channels to the base of the volcanoes accounts for many of the phenomena. The separation is not immediate, but the water is probably first converted into steam; this is then superheated and the oxygen is burned out and the hydrogen liberated expands with terrific force and its further heating gives it increased power. This would account for the groanings and rumblings in the mountain itself before the outbreak. When the mass of overlying matter is no longer heavy enough to resist the immense internal pressure, it gives way and a violent explosion or rather cyclonic expansion of the imprisoned gases results. This expansion is upwards, downwards and outwards, following the lines of least resistance. The surrounding atmosphere is at first pushed back with a rush, but simultaneously there is an effort towards readjustment. The superheated hydrogen at once seeks to combine with the cooler oxygen, and in the process of readjustment frequent discharges and flashes of flame are seen which explode the mixture of hydrogen and atmospheric air in combination. The process is now reversed and, instead of expansion, we have immediate contraction and condensation. Water is at once